NEWFOUNDLAND ENER

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Government of Newfoundland and Labrador
Department of Mines & Energy
Energy Policy Division

Newfoundland Energy Review — 1984

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Preface

This paper, the first of a series of annual reports on energy in the Province of Newfoundland, outlines the main energy demand and supply developments and events of 1983 and 1984. In addition it covers energy prices and conservation developments in the Province.

It is based on the latest available information from Statistics Canada and from provincial data sources including Newfoundland and Labrador Hydro, the Petroleum Directorate and the Newfoundland Statistics Agency.

1.0 Introduction

Over the last decade, the escalating cost of imported oil and the obvious decline in oil supply security forced most importing countries to cut back on oil consumption and to address all possible conservation and oil substitution options.

In Canada, widespread national and provincial programs to replace imported oil with more secure domestic energy forms and to conserve energy are now in place. Federal government policy, as set out in the National Energy Program of 1980 and its subsequent amendments, aimed primarily at increased domestic energy production, substantial reduction of oil consumption and replacement of oil by alternate energy forms. Energy conservation was given high priority in this policy which aimed at national self-sufficiency in energy by 1990 and a reduction in oil consumption from its 51 percent share of demand in 1980 to 10 percent of demand in 1990.

In most provinces, natural gas will play a major role in oil displacement. However in Newfoundland this is not possible at this time although it is possible that the substantial gas reserves now established in the Hibernia structure could become available for Island consumption within the next decade.

In the short and medium term, therefore, hydro-electricity and other alternates such as wood and peat are the main indigenous substitutes for oil in the Province. Conservation, as in the past, will continue to play a major role.

In 1980, when the National Energy Program was introduced, oil represented 51 percent of national energy demand and over 75 percent of Newfoundland energy demand. Since 1980, oil consumption dropped to approximately 47 percent of the national total in 1983 and to 66 percent of total consumption in Newfoundland.

Over the period 1980 to 1983 energy demand in Newfoundland declined by 13 percent while oil demand declined by 19 percent.

The decline in energy demand was obviously influenced by the recession of the last two or three years but energy conservation played a leading role, aided by a number of federal and provincial government programs which contributed tremendously to energy conservation in this Province.

Programs such as the Canadian Home Insulation Program (CHIP) and the Canadian Oil Substitution Program (COSP) gave residential consumers strong incentives to use energy more efficiently and to switch from oil to other energy forms. Commercial and industrial consumers were given opportunities to lower the impact of high energy prices via programs such as the National Energy Audit Program (NEAP) and the Atlantic Energy Conservation Investment Program (AECIP). Over recent years the Department of Mines and Energy provided a wide range of educational and informational programs aimed at driving home the virtues of energy conservation in all sectors. The Conservation and Renewable Energy Demonstration Agreement (CREDA), a five year cost shared agreement with the federal government, injected $9 million into energy conservation and alternate fuels demonstration projects. The CREDA program ended in 1984 but lead to the development of a provincially funded Alternate Fuels Development Program. This program is designed to assist in the development of the province's extensive resources of waste wood and fuel peat. A successful wood fuel conversion took place at the Newfoundland Hardwoods Limited plant in Clarenville and several other promising feasibility studies are in progress.

While these conservation and substitution efforts proved very effective, recent audits and studies show that there is still considerable potential for further savings in energy consumption in all sectors of the Province.

On the energy supply side, a number of important developments in both the hydro-electricity and offshore exploration and development areas took place over the last few years.

The 84 MW Upper Salmon hydro electric development was officially opened by the Premier on May 26, 1983 and the 127 MW Cat Arm hydro station on the Great Northern Peninsula was opened on June 20, 1985.

Several important court cases relating to the Province's efforts to secure a better deal on the Upper Churchill contract reached judgement. The Province also intervened in the National Energy Board enquiry into the export of electric power to the USA by Hydro Quebec.

The major event relating to the offshore in 1983 was undoubtedly the judgement by the Supreme Court of Newfoundland that the Province did not have jurisdiction over Newfoundland's continental margin. In March 1984 the Supreme Court of Canada ruled in favor of the federal government by giving it ownership and jurisdiction over offshore resources in the Hibernia area.

It is however correct to say that these legal reverses for the Province have been completely offset by the February 1985 signing of the Atlantic Accord between Canada and Newfoundland. The question of ownership is now at rest and the principles of the new agreement give Newfoundland all the management, control and revenue advantages that would apply if the petroleum resources were on land.

The level of exploration activity in the offshore area was high throughout 1983 and 1984 and agreements for the next few years point to a very healthy level of exploration and development operations which will substantially benefit the Province.

While offshore economics are obviously affected by uncertainties as to the future world price of oil, there seems to be general agreement that the great Hibernia structure will be developed as soon as practicable. While the reserves of the structure have been subject to some recent downward revision, the Newfoundland offshore petroleum operations remain the most promising frontier development in Canada.

Energy Demand by Sector

2.0 Energy Demand by Sector
2.1 Residential

Total energy demand in the residential sector declined by 6.7 percent over 1983 falling from 22.75 petajoules in 1982 to 21.23 petajoules in 1983. Petroleum product demand declined dramatically over the same period. In 1982 residential petroleum product demand amounted to 11.10 petajoules but in 1983 demand fell to 8.67 petajoules representing a decline of 21.9 percent. Electricity demand increased slightly by 2.0 percent while wood demand increased significantly by 17.2 percent. Demand for coal went from 0.05 petajoules in 1982 to 0.03 petajoules in 1983.

Table 1
Newfoundland Total Energy Demand
Residential Sector
1982 — 1983

	1982 PJ	1983 PJ	Percentage Change
Kerosene & Stove Oil	1.93	1.53	(20.7)
Light Fuel Oil	9.17	7.14	(22.1)
Total Petroleum Products	11.10	8.67	(21.9)
Electricity	7.01	7.15	2.0
Wood	4.59	5.38	17.2
Coal	0.05	0.03	(40.0)
TOTAL	22.75	21.23	(6.7)

Note: Brackets denote decline
Source: Statistics Canada, 57-003
Mines & Energy

FIGURE 1

There are basically two major factors that contributed to the decline in total energy demand in the residential sector. Firstly, 1983 experienced warmer temperatures than the previous year and, probably more importantly, continuing conservation efforts by householders resulted in lower energy requirements. In fact, during 1983 5,724 households received grants from the Canadian Home Insulation Program and 3,345 households received grants under the Canadian Oil Substitution Program for the purpose of lowering their individual energy needs through increased conservation methods.

Table 2
Newfoundland
Actual Degree Days By Major Centre
1982 — 1983

	1982 Actual	1983 Actual	Percentage Change
St. John's	5031.2	4601.4	(8.5)
Gander	5385.0	4927.7	(8.5)
Corner Brook	4990.2	4317.8	(13.5)
Stephenville	5074.3	4400.1	(13.3)
Average	5120.2	4561.8	(10.9)

Note: Degree Days is the difference of the daily mean temperature from 18°C. For example, if the daily temperature on a given day is 1°C then 17 degree day unit's are required to attain the standard of 18°C. Brackets Denote Decline
Source: St. John's Weather Station

Table 3
Newfoundland
Number of Grants Issued under
CHIP & COSP 1983

	CHIP	COSP	Total
Electricity Conversions	-	198	198
Wood Conversions	-	6,925	6,925
Propane Conversions	-	10	10
Total Conversions	-	7,133	7,133
Conservation	5,724	3,345	9,069
TOTAL	5,724	10,478	16,202

Source: Energy, Mines and Resources

The dramatic decline in petroleum product demand can also be attributed to warmer temperatures and conservation but more importantly, conversion from oil to wood, as an alternative heating source, has added greatly to the lower demand for petroleum products. During 1983, 6,925 grants were issued to householders under COSP for the purpose of conversion from oil to wood.

2.2 Commercial

Total energy demand in the commercial sector increased slightly by 1.4 percent in 1983. Petroleum product demand declined by 0.5 percent while electricity demand increased by 4.1 percent. Wood fuel demand in the commercial sector showed no change.

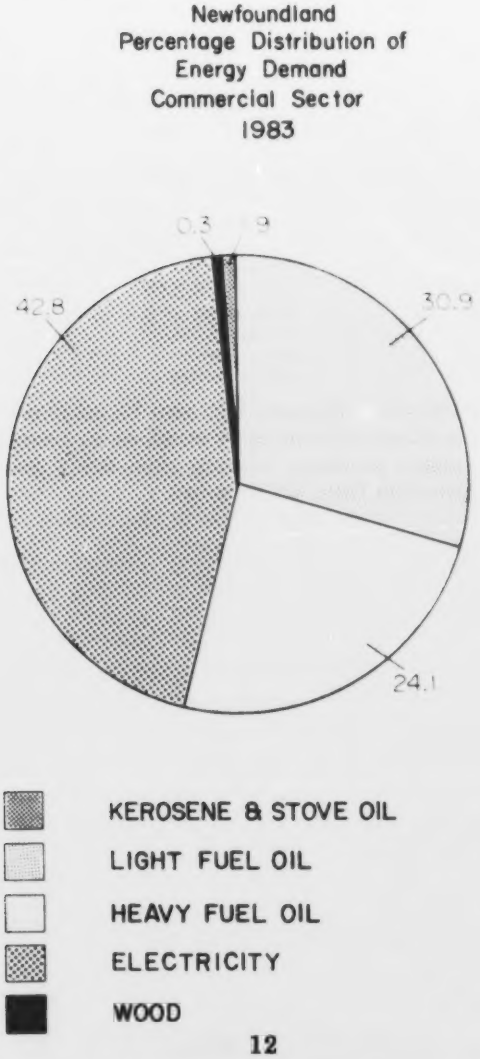
The commercial use of wood fuel to date has been limited to a few buildings which have installed automated wood fuel heating systems. This is a new technology to the Province and is expected to be well received, leading to a substantial increase in commercial wood fuel demand in the near future.

Table 4
Newfoundland Total Energy Demand
Commercial Sector 1982 – 1983

	1982 PJ	1983 PJ	Percentage Change
Kerosene & Stove Oil	0.26	0.18	(30.8)
Light Fuel Oil	4.11	2.95	(28.2)
Heavy Fuel Oil	1.09	2.30	111.0
Total Refined Petroleum Products	5.46	5.43	(0.5)
Electricity	3.92	4.08	4.1
Wood	0.03	0.03	-
TOTAL	9.41	9.54	1.4

Note: Brackets denote decline
Source: Statistics Canada, 57-003
Mines & Energy

FIGURE 2



2.3 Public Administration

Total energy demand in the public administration sector fell from 2.82 petajoules in 1982 to 2.67 petajoules in 1983, a decline of 5.3 percent. Petroleum product demand fell sharply by 6.0 percent while electricity demand declined by 2.0 percent.

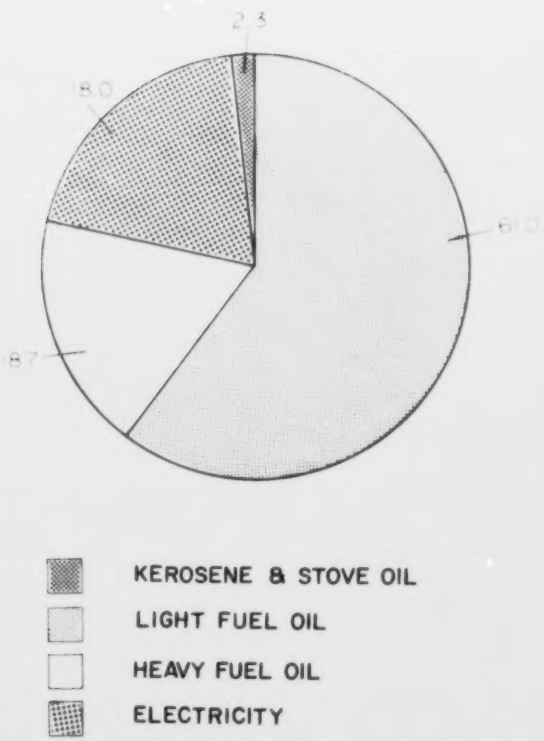
Table 5
Newfoundland Total Energy Demand
Public Administration Sector
1982 — 1983

	1982 PJ	1983 PJ	Percentage Change
Kerosene & Stove Oil	0.06	0.06	-
Light Fuel Oil	1.59	1.63	2.5
Heavy Fuel Oil	0.68	0.50	(26.5)
Total Refined Petroleum Products	2.33	2.19	(6.0)
Electricity	0.49	0.48	(2.0)
TOTAL	2.82	2.67	(5.3)

Note: Brackets denote decline
Source: Statistics Canada, 57-003

FIGURE 3

Newfoundland
Percentage Distribution of
Energy Demand
Public Administration Sector
1983



2.4 Industrial
2.4.1 Mining

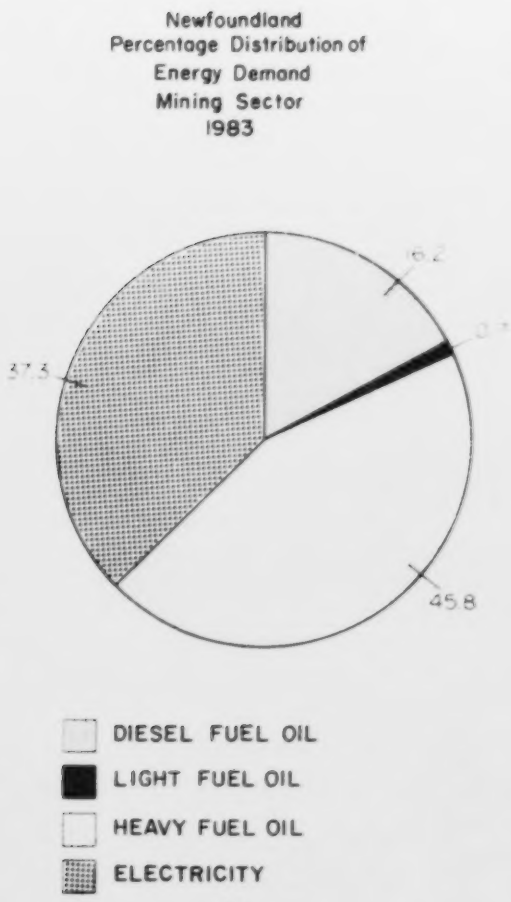
Total energy demand in the mining sector declined slightly during 1983, falling from 17.60 petajoules in 1982 to 17.46 petajoules in 1983, a difference of 0.8 percent. Petroleum product demand increased by 1.1 percent while electricity demand dropped by 3.8 percent.

Table 6
Newfoundland Total Energy Demand
Mining Sector
1982 — 1983

	1982 PJ	1983 PJ	Percentage Change
Diesel Fuel Oil	1.86	2.82	1.5
Light Fuel Oil	0.39	0.13	(66.7)
Heavy Fuel Oil	8.58	8.00	(6.8)
Total Petroleum Products	10.83	10.95	1.1
Electricity	6.77	6.51	(3.8)
TOTAL	17.60	17.46	(0.8)

Note: Brackets denote decline
Source: Statistics Canada, 57-003

FIGURE 4



2.4.2 Manufacturing

The manufacturing sector experienced a modest decline of 2.5 percent in energy demand during 1983. However, ıe demand for petroleum products fell significantly by 16.4 percent while electricity demand increased by 9.6 ercent.

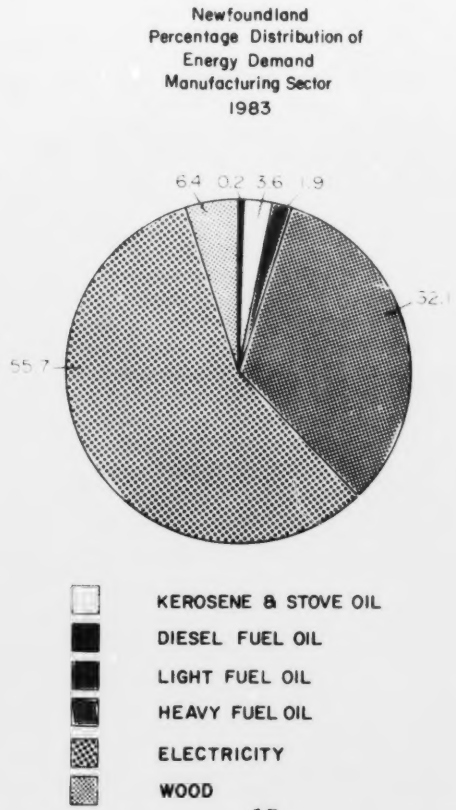
Demand for wood fuel remained unchanged in 1983. Wood fuel demand in this sector is basically demand by ıe pulp and paper industries. The amount of wood fuel that the paper companies can burn is limited to the ıpacity of their boilers so any significant increase in wood fuel consumption would require boiler replacements.

Table 7
Newfoundland Total Energy Demand
Manufacturing Sector
1982 — 1983

	1982 PJ	1983 PJ	Percentage Change
erosene & Stove Oil	0.02	0.03	(50.0)
iesel Fuel Oil	1.03	0.65	(36.9)
ight Fuel Oil	0.39	0.34	(12.8)
leavy Fuel Oil	6.63	5.73	(13.6)
otal Petroleum Products	8.07	6.75	(16.4)
lectricity	9.08	9.95	9.6
Wood	1.15	1.15	-
TOTAL	18.30	17.85	(2.5)

Note: Brackets denote decline
Source: Statistics Canada, 57-003

FIGURE 5



2.4.3 Forestry and Construction

Petroleum product demand in the forestry and construction sectors declined significantly in 1983 decreasing from 1.24 petajoules in 1982 to 0.70 petajoules in 1983.

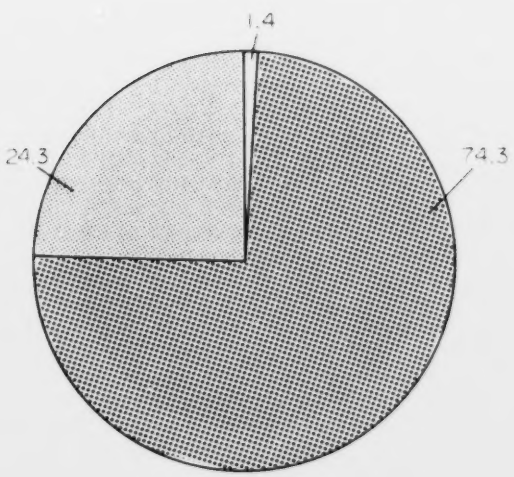
Table 8
Newfoundland Total Energy Demand
Forestry & Construction
1982 — 1983

	1982 PJ	1983 PJ	Percentage Change
Kerosene & Stove Oil	0.01	0.01	-
Diesel Fuel Oil	0.99	0.52	(47.5)
Light Fuel Oil	0.24	0.17	(29.2)
Heavy Fuel Oil	-	-	-
Total Refined Petroleum Products	1.24	0.70	(43.5)
Electricity	-	-	-
Wood	-	-	-
TOTAL	1.24	0.70	(43.5)

Note: Brackets denote decline
Source: Statistics Canada, 57-003

FIGURE 6

Newfoundland
Percentage Distribution of
Energy Demand
Forestry & Construction Sectors
1983



2.4.4 Total Industrial

Total energy demand in the industrial sector fell from 37.60 petajoules in 1982 to 36.32 petajoules in 1983, for a difference of 3.4 percent. Petroleum product demand declined significantly by 9.2 percent while electricity demand showed modest growth of 3.8 percent.

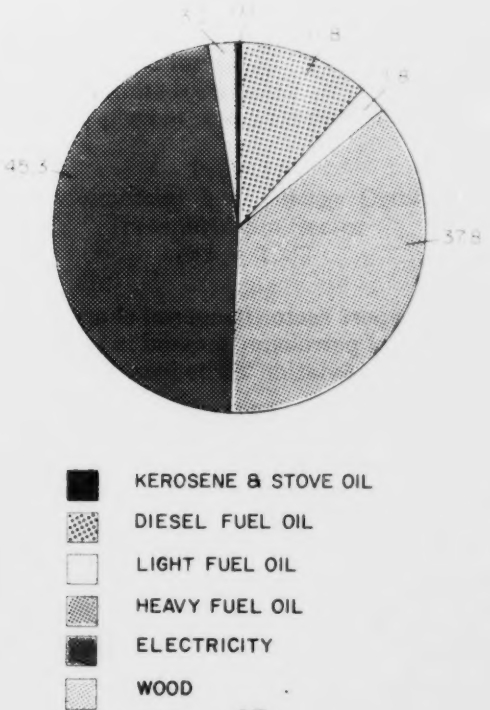
Table 9
Newfoundland Total Energy Demand
Industrial Sector
1982 — 1983

	1982 PJ	1983 PJ	Percentage Change
Kerosene & Stove Oil	0.04	0.04	-
Diesel Fuel Oil	4.32	4.30	(0.5)
Light Fuel Oil	1.02	0.64	(37.3)
Heavy Fuel Oil	15.22	13.73	(9.1)
Total Refined Petroleum Products	20.60	18.71	(9.2)
Electricity	15.85	16.46	3.8
Wood	1.15	1.15	-
TOTAL	37.60	36.32	(3.4)

Note: Brackets denote decline
Source: Statistics Canada, 57-003

FIGURE 7

Newfoundland
Percentage Distribution of
Energy Demand
Industrial Sector
1983



2.5 Transportation

2.5.1 Road

Total petroleum demand in the road transport sector decreased by 1.2 percent over the period 1982-1983. M
tor gasoline demand declined 5.4 percent as the trend towards smaller and more efficient automobiles continue

Diesel fuel oil increased dramatically over this same period, a reflection of increased activity in the commerci
trucking industry associated with decreased rail transport activity.

Table 10
Newfoundland Total Energy Demand
Road Transport 1982 — 1983

	1982 PJ	1983 PJ	Percentage Change
Motor Gasoline	20.12	19.03	(5.4)
Diesel Fuel Oil	8.40	9.16	9.1
TOTAL	28.52	28.19	(1.2)

Note: Brackets denote decline
Source: Statistics Canada, 57-003

2.5.2 Rail

Diesel fuel oil demand in the rail sector fell by more than half during 1983, a continuation of the past trend in the rail transport industry. The move away from the railway towards other transportation modes, particularly the trucking industry has led to significant reductions in energy demand in the rail sector.

Table 11
Newfoundland Total Energy Demand
Rail Transport
1982 — 1983

	1982 PJ	1983 PJ	Percentage Change
Diesel Fuel Oil	0.10	0.04	(60.0)
TOTAL	0.10	0.04	(60.0)

Note: Brackets denote decline
Source: Statistics Canada, 57-003

2.5.3 Air

Total petroleum demand in the air transport sector increased sharply by 11.9 percent in 1983. Aviation gasoline, which represents a small portion of petroleum demand in the air transport sector, grew from 0.12 petajoules in 1982 to 0.13 petajoules in 1983. Aviation Turbo increased to 8.51 petajoules in 1983 compared with 7.60 petajoules in 1982.

Table 12
Newfoundland Total Energy Demand
Air Transport
1982 — 1983

	1982 PJ	1983 PJ	Percentage Change
Aviation Gasoline	0.12	0.13	8.3
Aviation Turbo	7.60	8.51	12.0
TOTAL	7.72	8.64	11.9

Source: Statistics Canada, 57-003

2.5.4 Marine

Petroleum demand in the Marine sector showed relatively high growth in 1983 increasing from 3.27 petajoules in 1982 to 3.52 petajoules in 1983.

Table 13
Newfoundland Total Energy Demand
Marine Transport
1982 — 1983

	1982 PJ	1983 PJ	Percentage Change
Diesel Fuel Oil	2.95	3.02	2.4
Heavy Fuel Oil	0.32	0.50	56.3
TOTAL	3.27	3.52	7.6

Source: Statistics Canada, 57-003

2.5.5 Total Transportation

Overall, the transportation sector showed a slight increase in petroleum demand in 1983. Motor gasoline declined by 5.4 percent. Diesel fuel oil demand increased by 6.7 percent. Heavy fuel oil demand increased significantly by 56.3 percent but in actual units increased by 0.18 petajoules. Demand for aviation gasoline and aviation turbo fuel increased by 8.3 percent and 12.0 percent respectively.

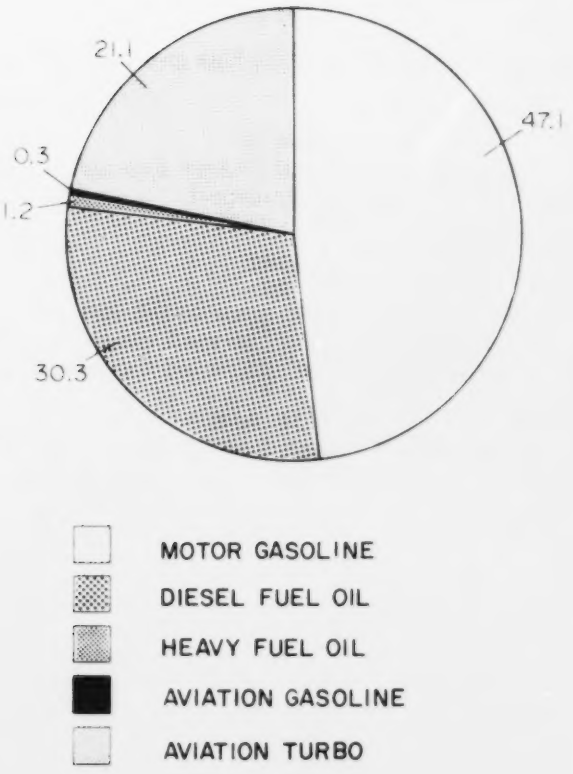
Table 14
Newfoundland Total Energy Demand
Transportation Sector
1982 — 1983

	1982 PJ	1983 PJ	Percentage Change
Motor Gasoline	20.12	19.03	(5.4)
Diesel Fuel Oil	11.45	12.22	6.7
Heavy Fuel Oil	0.32	0.50	56.3
Aviation Gasoline	0.12	0.13	8.3
Aviation Turbo	7.60	8.51	12.0
TOTAL	39.61	40.39	2.0

Note: Brackets denote decline
Source: Statistics Canada, 57-003

FIGURE 8

Newfoundland
Percentage Distribution
Energy Demand
Transportation Sector
1983



2.6 Total Net Energy Demand

Total net energy demand (excluding petroleum products used for electricity generation and for non-energy purposes) in the Province decreased 1.8 percent over the period 1982-1983. In 1982 total net energy demand amounted to 116.64 petajoules and in 1983 it fell to 114.50 petajoules. The decline of 5.3 percent in petroleum product demand was a major factor in the overall drop in demand. Electricity and wood offset the decline somewhat. Increases in demand for those two energy forms in 1983 were 4.3 percent and 13.7 percent respectively.

There were basically three contributing factors for this decrease in demand. Firstly, the decline in economic activity in 1983. Real GDP fell by almost 2 percent between 1982 and 1983. Secondly, continued conservation efforts has allowed consumers to use energy more efficiently and thirdly weather conditions in 1983 were much milder than was experienced in the previous year.

Table 15
Newfoundland Total Net Energy Demand
By Sector and By Energy Form 1982 — 1983

	1982 PJ	1983 PJ	Percentage Change
Residential			
Petroleum Products	11.10	8.67	(21.9)
Electricity	7.01	7.15	2.0
Coal	0.05	0.03	(40.0)
Wood *	4.59	5.38	17.2
TOTAL	22.75	21.23	(6.7)
Commercial			
Petroleum Products	5.46	5.43	(0.5)
Electricity	3.92	4.08	4.1
Wood *	0.03	0.03	-
TOTAL	9.41	9.54	1.4
Public Administration			
Petroleum Products	2.33	2.19	(6.0)
Electricity	0.49	0.48	(2.0)
TOTAL	2.82	2.67	(5.3)
Industrial			
Petroleum Products	20.60	18.71	(9.2)
Electricity	15.85	16.46	3.8
Wood *	1.15	1.15	-
TOTAL	37.60	34.32	(3.4)
Transportation			
Petroleum Products	39.61	40.39	2.0
TOTAL	39.61	40.39	2.0
Own Use & Losses			
Petroleum Products	0.91	0.40	(56.0)
Electricity	3.54	3.95	11.6
TOTAL	4.45	4.35	(2.2)
Total Energy Demand			
Petroleum Products	80.01	75.79	(5.3)
Electricity	30.81	32.12	4.3
Coal	0.05	0.03	(40.0)
Wood *	5.77	6.56	13.7
TOTAL	116.64	114.50	(1.8)

*Estimated

Note: Brackets denote decline. Excludes petroleum products used for electricity generation and for non-energy purposes.
Source: Statistics Canada, 57-003
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FIGURE 9

Newfoundland
Percentage Distribution
Total Net Energy Demand
1983

By Energy Form

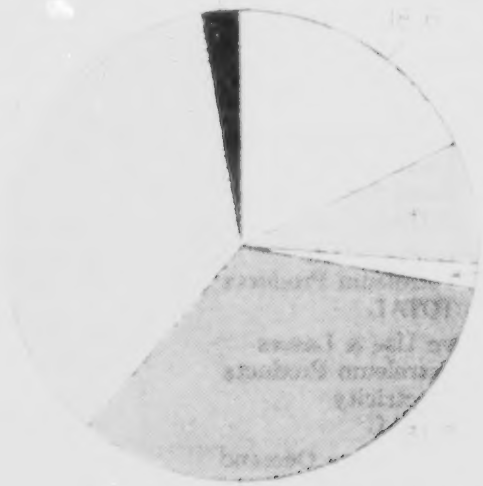
PETROLEUM PRODUCTS

ELECTRICITY

COAL

WOOD

By Sector



RESIDENTIAL

COMMERCIAL

PUBLIC ADMINISTRATION

INDUSTRIAL

TRANSPORTATION

OWN USE & LOSSES

Table 16
Newfoundland Total Petroleum
Product Demand By Fuel Type
1982 — 1983

	1982 PJ	1983 PJ	Percentage Change
Motor Gasoline	20.53	19.21	(6.4)
Kerosene & Stove Oil	2.29	1.81	(21.0)
Diesel Fuel Oil	15.77	16.52	4.8
Light Fuel Oil	15.89	12.36	(22.2)
Heavy Fuel Oil	17.72	17.25	(2.7)
Aviation Gasoline	0.12	0.13	8.3
Aviation Turbo Fuel	7.60	8.51	12.0
TOTAL	80.01	75.79	(5.3)

Note: Brackets denote decline. Excludes petroleum products used for electricity generation and for non-energy purposes.
Source: Statistics Canada, 57-003
Mines & Energy

2.7 Petroleum Products Used in Electricity Generation

Demand for petroleum products by the utilities in the Province declined dramatically during 1983. As can be seen in Table 17 petroleum products used in thermal stations in 1983 amounted to 7.89 petajoules compared to 13.65 petajoules in 1982, a decline of 42.2 percent. Diesel fuel oil, which represented about 14 percent of total petroleum products used for electricity generation in 1983, decreased by 7.5 percent over the period. Heavy fuel oil, decreased by 45.7 percent from 12.23 petajoules in 1982 to 6.64 petajoules in 1983. The major reason for the decline in petroleum products used by the utilities was the additional hydro made available from the Godaleich power plant. In 1983, the Godaleich plant provided additional hydro generation of 2.1 petajoules.

Table 17
Newfoundland Petroleum Products
Used in the Generation of Electricity
1982 — 1983

	1982 PJ	1983 PJ	Percentage Change
Diesel Fuel Oil	1.20	1.11	(7.5)
Light Fuel Oil	0.22	0.14	(36.4)
Heavy Fuel Oil	12.23	6.64	(45.7)
TOTAL	13.65	7.89	(42.2)

Note: Brackets denote decline
Source: Statistics Canada, 57-003

2.8 Products Used For Non-Energy Purposes

Total products used for non-energy purposes increased by 3.9 percent from 4.60 petajoules in 1982 to 4.78 petajoules in 1983. Demand for naphtha specialties (mainly cleaning agents) remained unchanged over this period. Demand for asphalt and coke on the other hand, increased by 6.1 percent and 4.6 percent respectively, while, demand for lubricating oils and greases decreased by 5.9 percent.

Table 18
Newfoundland Products Used
For Non-Energy Purposes
1982 – 1983

	1982 PJ	1983 PJ	Percentage Change
Naphtha Specialties	0.04	0.04	
Asphalt	1.65	1.75	6.1
Lubrication Oils and Greases	0.50	0.48	(5.9)
Coke	2.40	2.51	4.6
TOTAL	4.60	4.78	3.9

Note: Brackets denote decline
Source: Statistics Canada, 57-003

Energy Supply

3.0 Energy Supply

3.1 Offshore Petroleum & Gas Development

Statistics released by the Petroleum Directorate indicate a high level of exploration activity offshore Newfoundland and Labrador. It is estimated that over $520 million was expended on offshore oil and gas exploration during 1984. This is up substantially over the 1983 figure of approximately $410 million. Up to March 31, 1985, 108 wells have been spudded: 27 on the Labrador Shelf, 7 off the North East Coast and 74 on the Grand Banks. During 1984, operations were conducted at 17 well locations: 12 of these were new locations, 4 were continuations of the 1983 program and 1 was a re-entry on a well suspended in 1983. In 1984, nine rigs under contract to four operators (Mobil, Husky/Bow Valley, Petro-Canada and Canterra) conducted approximately 54 rig-months of drilling operations. In 1985, at least six operators are expected to be active and overall activity is expected to increase by about 60 percent.

The Northern Grand Banks is now the principal focus of exploration activity, and in recent years, there has been one significant discovery for every 2.5 wells drilled. This is far above industry averages and accounts, as much as anything else, for the increase in exploration activity expected during 1985.

There have now been 18 significant hydrocarbon discoveries, as follows:

Prior to 1984

Offshore Labrador (6)

• Bjarni	Gas
• Gudrid	Gas
• Snorri	Gas
• North Leif	Oil
• North Bjarni	Gas
• Hopedale	Gas

Grand Banks (6)

• Adolphus	Oil
• Hibernia	Oil/Gas
• Ben Nevis	Oil/Gas
• South Tempest	Oil/Gas
• Hebron	Oil/Gas
• Nautilus	Oil/Gas

During 1984

• North Dana	Gas
• Trave	Gas
• Terra Nova	Oil/Gas
• South Mara	Oil/Gas

To Date in 1985

• Whiterose	Oil/Gas
• Beothuk	Oil

In addition to the drilling activity, an extensive geophysical program has been ongoing. During 1984, 27,000 km. of reflection seismic data were collected; the total collected since 1966 now exceeds 506,000 km.

The likelihood of additional discoveries on the Grand Banks is high. Resource estimates by the Petroleum Directorate for the Grand Banks and North East Shelf areas indicate the presence of about 12 billion barrels of oil and 43 trillion cubic feet of gas. Resource estimates for the Labrador Shelf area indicate a total volume of 2 billion barrels of oil and 44 trillion cubic feet of gas.

In terms of direct employment, at the end of December 1984, 2189 persons were employed offshore and onshore (operators, drilling and service contractors). Of these, 1372 were Newfoundland residents. In addition, 304 Newfoundland residents were employed in operations elsewhere in the world.

At present, approximately 60 locally based companies are under direct contract to provide support services to exploration operations. Also, in the past five years, approximately 300 companies have set up or have

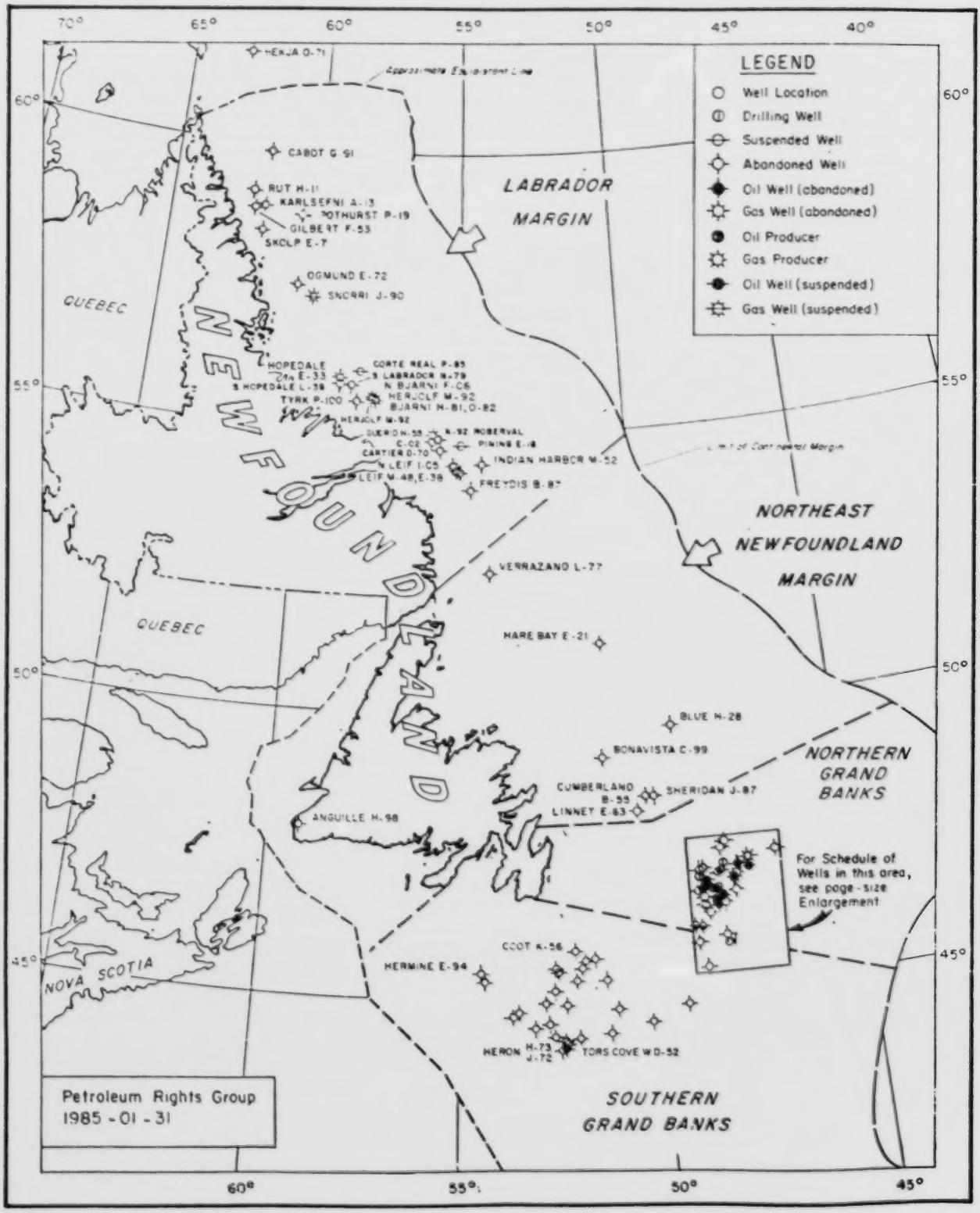
xpanded their operations to serve the oil industry. During 1984, six helicopters and 19 supply vessels were nder charter in support of drilling operations. Under the Department of Development's Ocean Industries apital Assistance Program, the Provincial Government has provided assistance to 18 companies to estab-sh or expand their operations to serve the oil industry.

An important development relating to the offshore dispute between Canada and Newfoundland was the cision of the Supreme Court of Newfoundland in February, 1983 which declared, that while Newfound-nd had the right to exploit the mineral resources of its continental margin prior to joining Canada in 1949, cause it did not exercise or declare this right before Confederation, that it was not retained under the rms of union with Canada.

In May 1982, the federal government had referred its own case to the Supreme Court of Canada. These igh Court proceedings were devoted specifically to ownership of the Hibernia oil field. In March 1984, unanimous decision, the Supreme Court of Canada ruled in favor of the federal government by giving ownership and jurisdiction over offshore resources in the Hibernia area.

While this was a disappointing defeat for Newfoundland, events subsequent to the October 1984 federal ection completely resolved the long standing dispute between the federal and provincial governments as management and revenue sharing relating to offshore development. Under the terms of the Atlantic Ac-ord signed in February 1985, the offshore resource will be regarded as if it were on land for revenue sharing urposes. Even more important to Newfoundland, it will share equally in control of development and roduction.

FIGURE 10A
OFFSHORE OIL AND GAS ACTIVITY



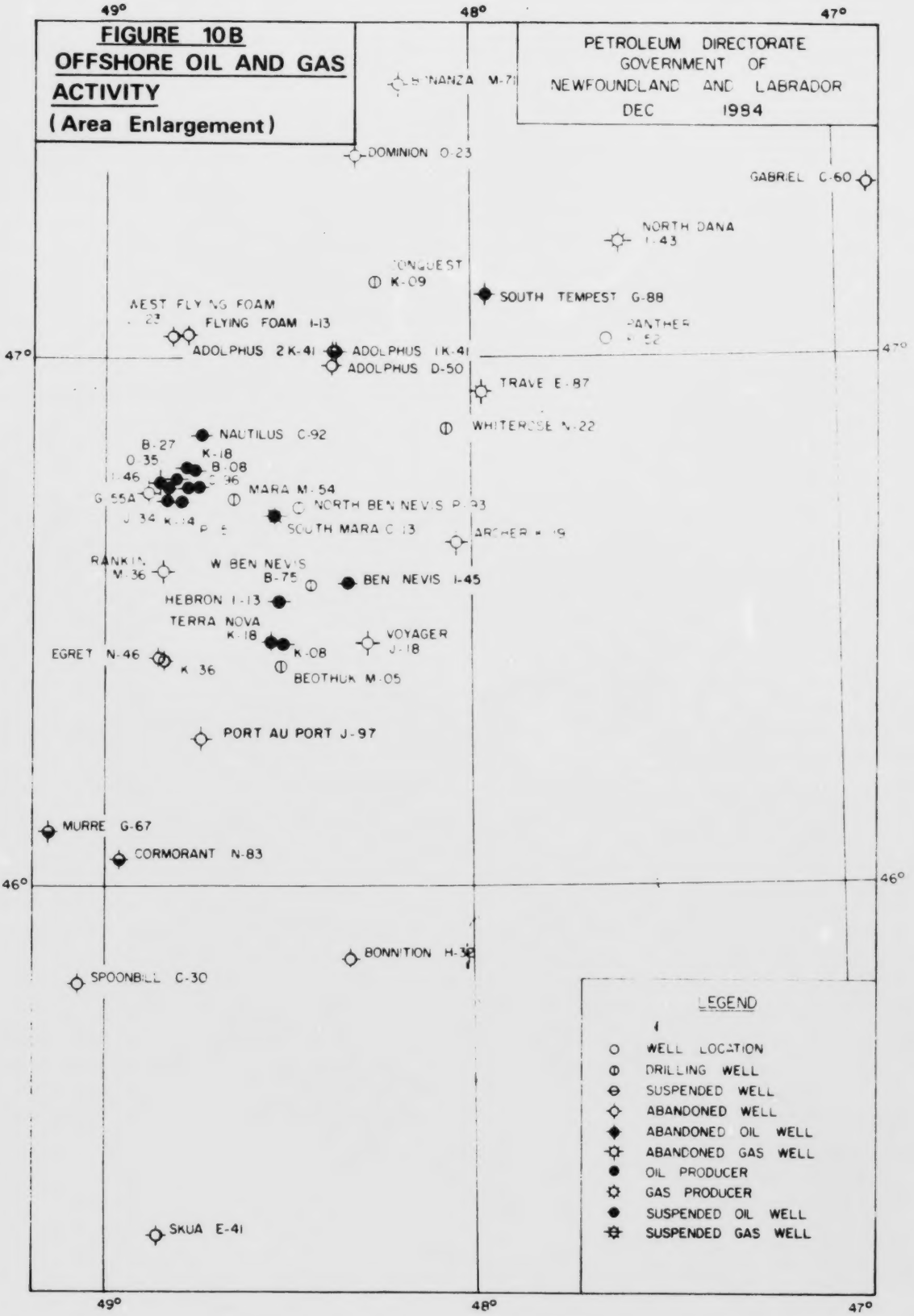
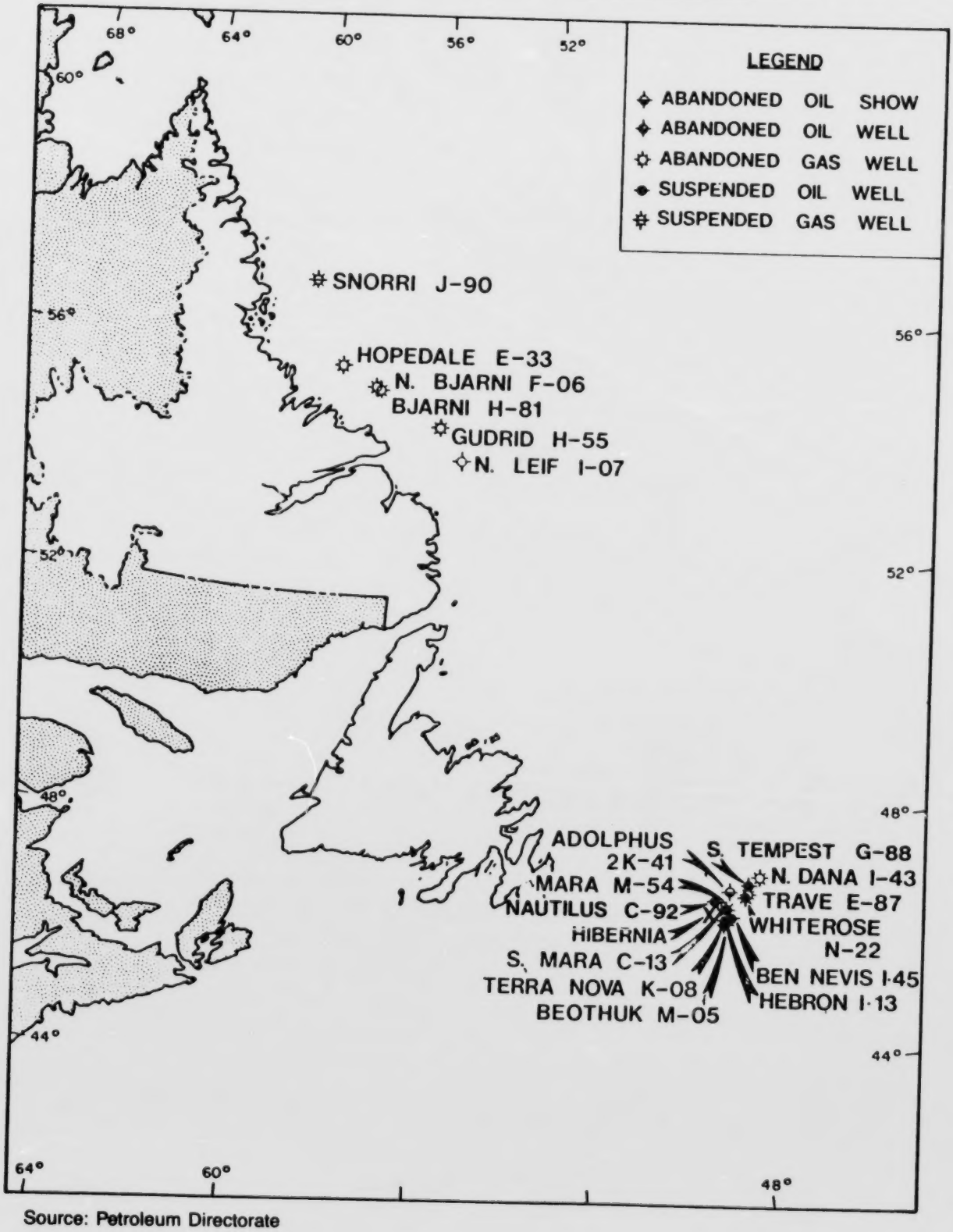

49°
48°
47°
FIGURE 10B
OFFSHORE OIL AND GAS ACTIVITY
(Area Enlargement)
PETROLEUM DIRECTORATE
GOVERNMENT OF
NEWFOUNDLAND AND LABRADOR
DEC 1984
DOMINION O-23
GABRIEL C-60
NORTH DANA I-43
CONQUEST K-09
SOUTH TEMPEST G-88
FLYING FOAM I-13
ADOLPHUS 2K-41
ADOLPHUS 1K-41
ADOLPHUS D-50
TRAVE E-87
WHITEROSE N-22
NAUTILUS C-92
B-27
K-18
O 35
B-08
MARA M-54
NORTH BEN NEVIS
SOUTH MARA C-13
RANKIN M-36
W BEN NEVIS B-75
BEN NEVIS I-45
HEBRON I-13
TERRA NOVA K-18
VOYAGER J-18
K-08
EGRET N-46
K 36
BEOTHUK M-05
PORT AU PORT J-97
MURRE G-67
CORMORANT N-83
BONNITION H-38
SPOONBILL C-30
SKUA E-41
LEGEND
WELL LOCATION
DRILLING WELL
SUSPENDED WELL
ABANDONED WELL
ABANDONED OIL WELL
ABANDONED GAS WELL
OIL PRODUCER
GAS PRODUCER
SUSPENDED OIL WELL
SUSPENDED GAS WELL
47°
46°
49°
48°
47°

FIGURE 10 C
SIGNIFICANT DISCOVERIES - OFFSHORE OIL AND GAS



Source: Petroleum Directorate

3.2 Electricity Supply

During the first nine months of 1984 hydrological conditions in the Province were exceptionally good. As a result hydro production for the year was high. Hydro facilities at Churchill Falls, Bay D'Espoir and Godaleich (Upper Salmon) all contributed to high energy production. However production from Hinds Lake was down by some 7 percent over this same period due to technical difficulties at the site.

Hydro generation at Churchill Falls increased substantially in 1984, going from 33,900,000 megawatt hours in 1983 to 39,000,000 megawatt hours in 1984. This increase was a direct result of increased sales to Quebec. During 1983 Quebec sales were at a low of 31,000,000 megawatt hours while 1984 sales increased to 36,000,000 megawatt hours.

Production from Godaleich in 1984 was higher than average. The 84 megawatt plant has an average annual output of 555,000 megawatt hours. In the first year of operation the plant produced 584,000 megawatt hours or 12 percent above average and in 1984 the plant produced 647,000 megawatt hours or 24 percent above average.

While hydrological conditions were extremely good during the first nine months of 1984 the last three months showed a complete turnaround. Extreme dry conditions led to a dramatic increase in thermal generation. Holyrood generation in 1984 amounted to 810,000 megawatt hours compared to 614,000 megawatt hours in 1983, an increase of almost 32 percent.

By the end of 1984 construction on the Cat Arm Project was nearing completion. Cat Arm will provide an additional 127 megawatts and 676,000 megawatt hours to the Island generating system and will displace 1.1 million barrels of Bunker "C" fuel annually. The capital cost of the project is estimated at $320 million. The project was officially opened in June of 1985.

Total electricity generation in 1984 amounted to 163.09 petajoules or 12.8 percent higher than in 1983. Thermal generation increased from 2.49 petajoules in 1983 to 2.81 petajoules in 1984, for a difference of 12.9 percent. Sales to Quebec increased by 15.4 percent while total electricity available to the Province increased by 3.7 percent.

Table 19
Newfoundland
Electricity Generation
1983 — 1984

	1983 PJ	1984 PJ	Percentage Change
Hydro	142.07	160.28	12.8
Thermal	2.49	2.81	12.9
TOTAL	144.56	163.09	12.8
Delivered to Other Provinces	112.42	129.76	15.4
Total Available to Province	32.14	33.33	3.7

Source: Statistics Canada, 57-001
Newfoundland & Labrador Hydro
Power Distribution District

FIGURE IIA

Newfoundland
Electricity Generation Facilities
and
Transmission Lines

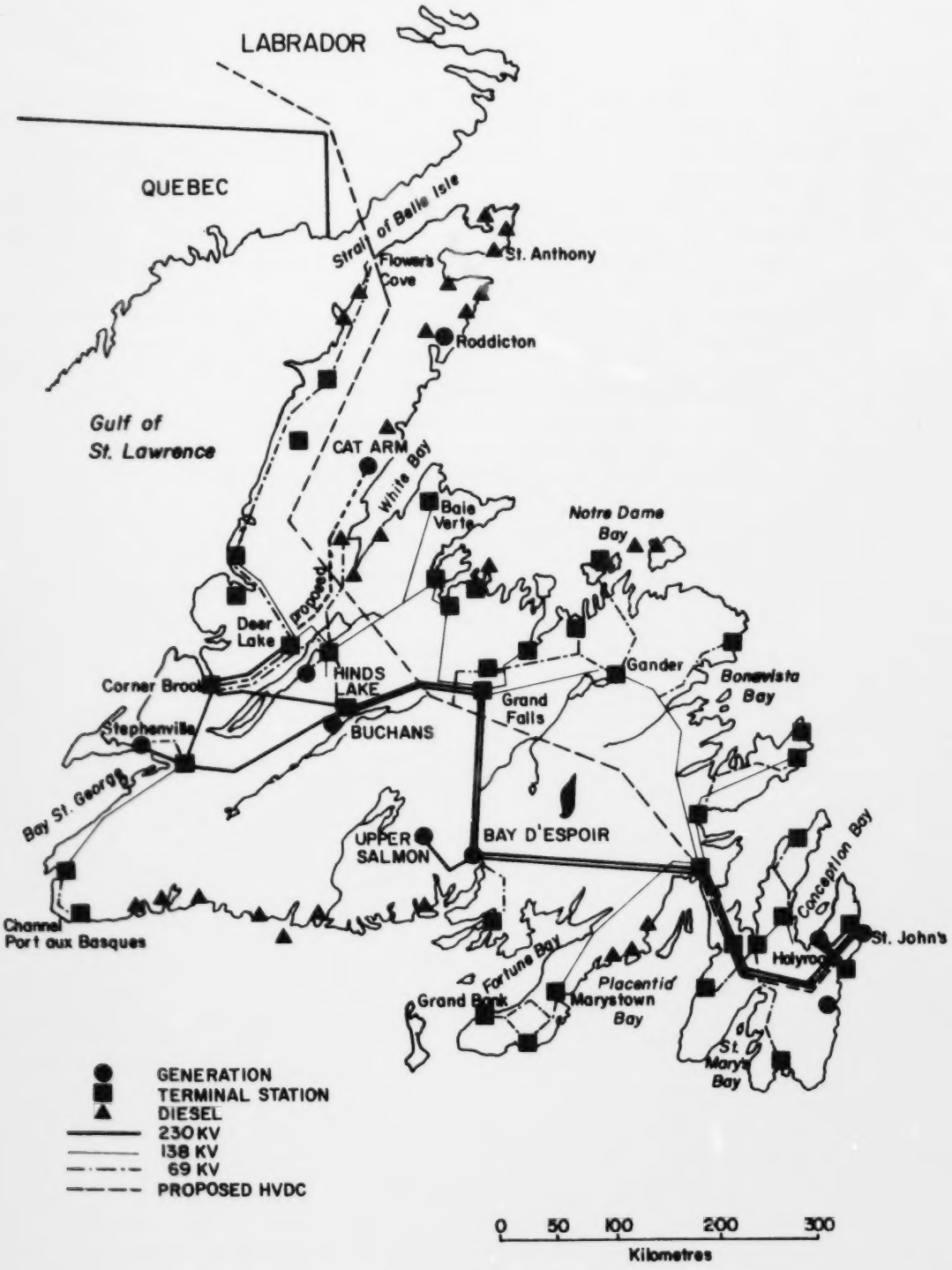


FIGURE IIB

Labrador
Electricity Generation Facilities
and
Transmission Lines

3.3 Provincial Woodfuel Supply

Prior to 1980 fuel wood was a fairly small portion of the total volume of wood cut in the province. Since then the amount of woodfuel cut has increased steadily and now accounts for one-quarter of total wood production in the province. The sharp increase in annual fuelwood demand has given rise to concern that it may exceed available supplies in certain areas. However the Annual Allowable Cut (AAC) which specifies the amount of wood which may be cut for commercial and domestic use in each of the 19 forest management units only includes the productive forest areas and does not include the non-commerical stands. Much of the current woodfuel supply comes from hardwood stands, non-commercial stands and residuals from sawmills and logging operations. Due to the problem of not being able to closely monitor the volumes cut, the wood taken from these other sources may be wrongly included in the AAC. This creates an over estimate of the drain on productive forest areas.

The use of woodfuel in the commercial and industrial sectors is expected to increase in the future. To quantify the amount of wood available to these sectors, forestry personnel have carried out a supply survey. The estimates in Table 20 apply to residual wood: sawmill residues, logging residues, and stand residues. The domestic fuelwood supply has not been included in the estimates because it is accounted for in the AAC. The estimates on residues from mill and logging operations are provided on a yearly basis, while stand residues are based on the total volume available. The actual amount permitted to be cut annually from stand residues would have to be determined by the Department of Forest, Resources and Lands (for the purpose of estimating annual supply for this report a 20 year harvesting period is assumed). The Avalon and Burin Peninsulas have been excluded from the inventory because the annual allowable cut is currently being met and no new allocations are being given for commercial and industrial fuel.

The forestry department is planning more detailed studies in the central and western regions of the province. It has also been recommended that the unit foresters include woodfuel stands in their 5 year operating and 10 year management plans.

Table 20
Newfoundland
Regional Yearly Residue Supply — 1983
PJ

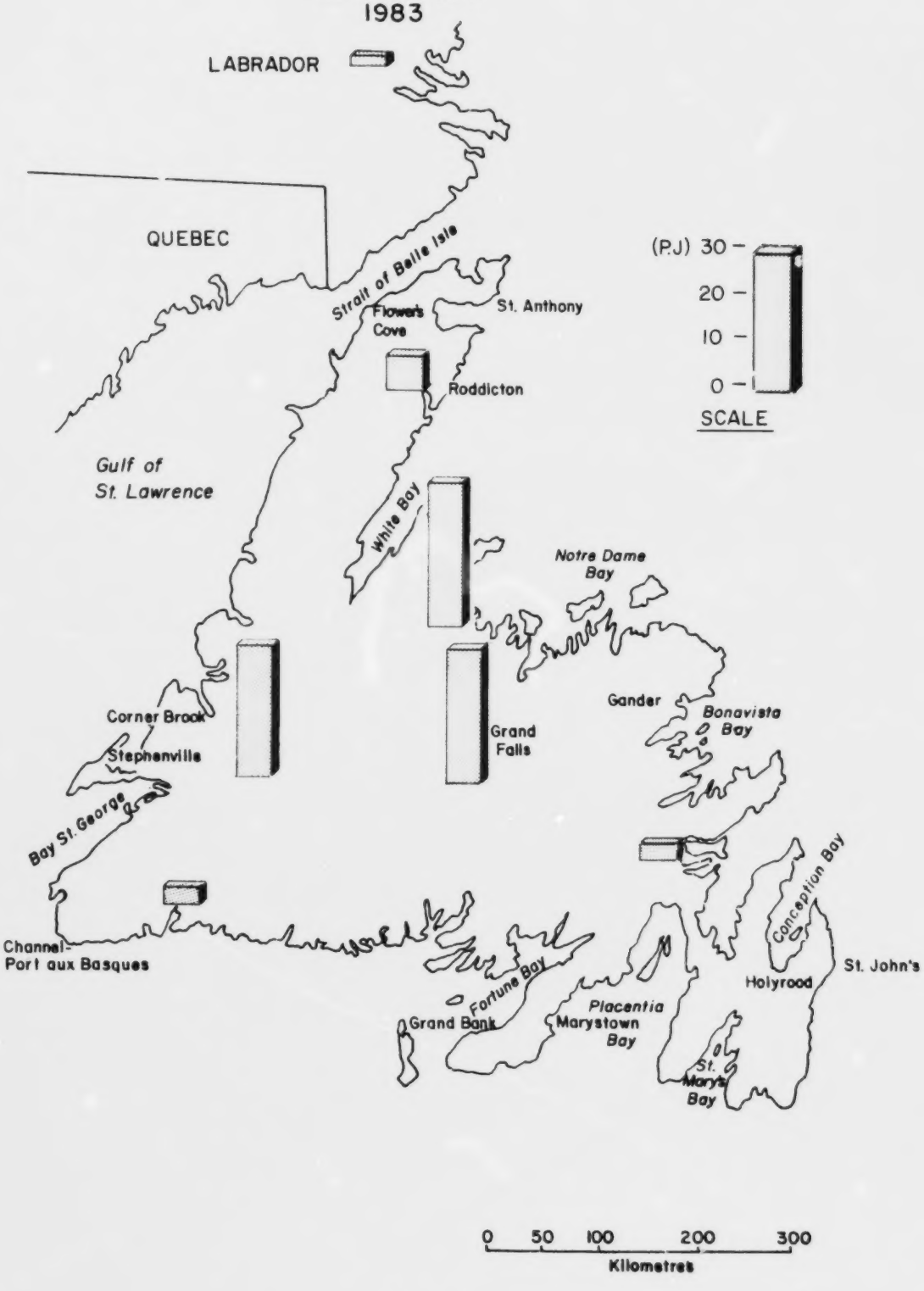
Type of Residue	East	North East	Central	West	Nothern Peninsula	South	Labrador	Total
Logging	0.82	31.94	24.51	26.77	2.58	3.54	0.16	90.37
Mill	0.82	0.56	1.17	0.18	0.96	0.08	0.06	3.82
Stands *	5.23	0.19	4.16	1.72	3.98	0	0.91	16.19
TOTAL	6.87	32.69	29.89	28.66	7.52	3.62	1.13	110.38

* Assumes a 20 year harvesting life

Source: Biomass Fuel Survey, Department of Forest Resources and Lands, Report FPD-19.

FIGURE 12

Newfoundland
Regional Annual Wood
Residue Supply
1983



3.4 Peat Supply

A series of inventories from 1978 to 1983 has provided much improved estimates on the location and volume of the province's peat resource. The Von Post scale of decomposition was used to classify the peat and the samples were sub-grouped into three classes H1-H4, H5-H7 and H8-H10. The H1-H4 group is normally used for horticultural purposes and the H5-H10 for fuel.

The inventory has identified approximately 1.1 million hectares of peatland or about 10 percent of the surface area of the island portion of the province. This is a fairly conservative estimate as many of the small patches of peatlands (less than .5 hectares) were excluded. The criteria for the inventory of the south-west region was changed to exclude any peatland areas less than 30 hectares.

There is a tremendous amount of energy potential in the province's fuel peat reserves but only a limited amount of this can be regarded as economically recoverable. Many of the sites are either too small or not deep enough for commercial development. Other factors such as accessability, transportation and environmental concerns also influence development of fuel peat sites. For the purpose of calculating the recoverable peat reserves from the total fuel peat reserves only peatlands with an area greater than 50 hectares and a minimum average depth of .95 meters have been included. Table 21 outlines estimated energy value of the fuel peat reserves by region.

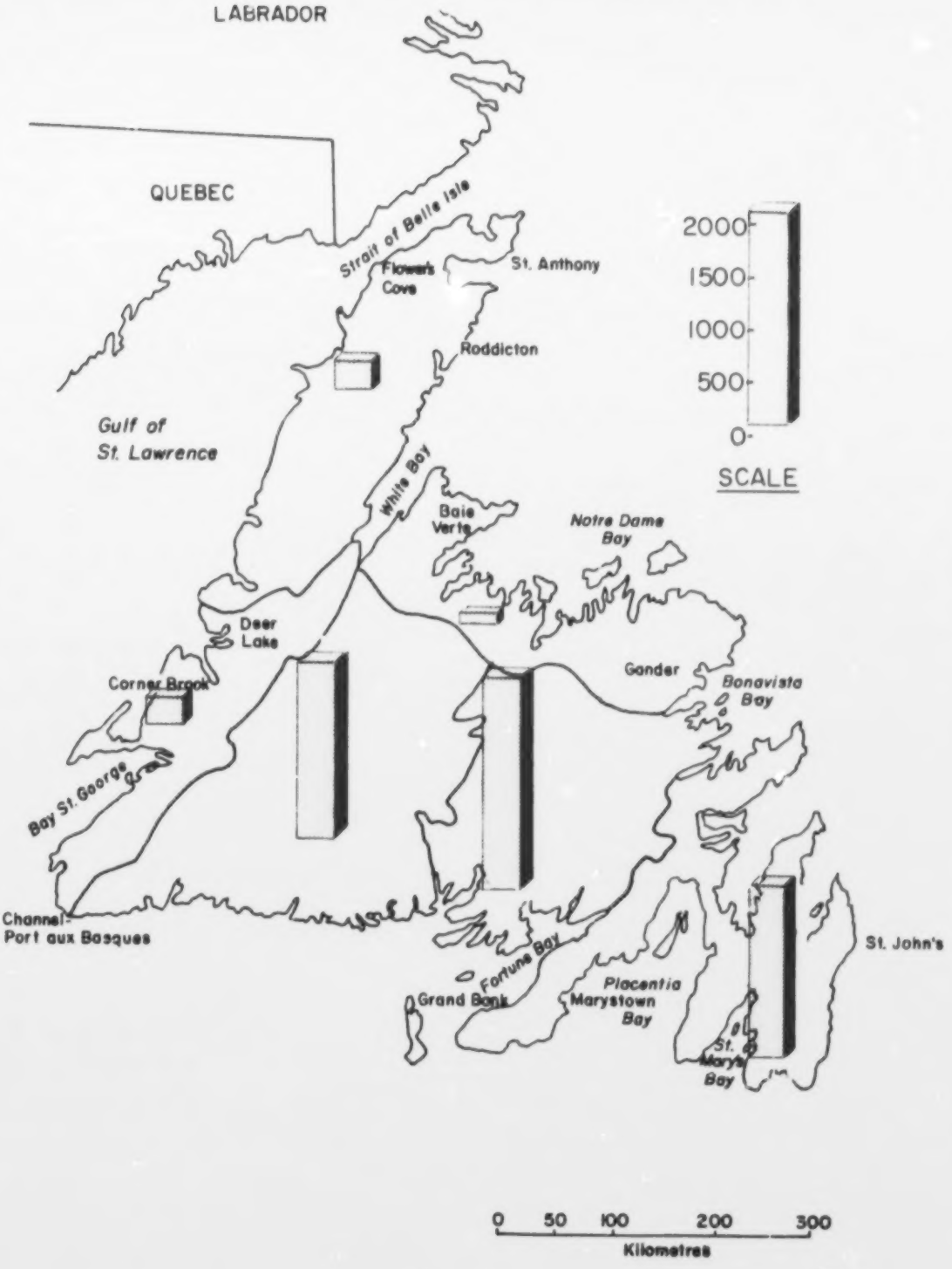
Table 21
Newfoundland Regional Comparison of Peat Reserves
1983
PJ

Region	Estimated Fuel Peat Reserves	Recoverable Fuel Peat Reserves
North East	1,534	74
West	1,235	246
East	4,330	1,573
North	1,658	279
South East	4,311	1,996
South West	1,900	1,615
TOTAL	14,968	5,783

Source: Newfoundland Peat Inventory, Northland Associates Ltd., 1978 — 1983.

FIGURE 13

Newfoundland
Recoverable Fuel Peat
Reserves
1983



Energy Prices

4.0 Energy Prices

4.1 Petroleum Product Prices

4.1.1 Background

Over the period 1982/1983, the trend of the previous decade toward increasing crude oil prices changed. With the world experiencing recession, markets for crude oil weakened, leading to an over abundant supply. The result, major oil exporting countries found themselves unable to unload crude at their asking prices. Thus world prices began to fall.

In February 1983, major non-OPEC oil producing countries (i.e. USSR, Mexico and Great Britain) lowered their crude oil prices in an effort to increase or at least maintain their markets. Nigeria, one of OPEC's members, followed suit in an attempt to sell crude which could not be sold under the existing pricing policies.

In March 1983, after long hours of deliberation OPEC members agreed on price reductions. The "market" or reference price of Saudi light crude oil dropped from $34.00 U.S. per barrel to $29.00 U.S.

As a result of the decreasing world prices of crude, pricing policies in Canada were in disarray and the need for change was inevitable. By June 1983 Canadian crude price ceilings were exceeding the limits specified in the Ottawa/Alberta Agreement.

On July 1, 1983 the Federal and Alberta Governments signed a new agreement to amend the 1981 Agreement. This agreement promised stable prices for a period of 18 months, until January 1, 1985, providing world prices remained stable.

From June 1, 1985, as a result of the Western Accord, producers of oil will negotiate sales contracts directly with crude oil purchasers and the market will determine the price of oil.

4.1.2 Petroleum Product Prices in Newfoundland

The overall impact on petroleum product prices for this Province over the period 1983 to 1984 stemming from the above events can be seen in Tables 22 to 24. These tables were taken from a report 'Annual Costs of Fuel and Utilities Newfoundland and Labrador, 1984' published in September of 1984 by the Department of Mines and Energy and the Newfoundland Statistics Agency. This report has been published annually for the past several years and is based on a survey that is carried out in approximately 58 communities in Newfoundland & Labrador.

The provincial average price of furnace oil in April 1984 was 37.4 cents per litre or 3.9 percent higher than the previous year. Residents of the Northern Peninsula paid the highest price at 38.9 cents per litre whereas St. George's residents paid the low of 36.8 cents per litre.

The provincial average price for stove oil increased from 37.8 cents per litre to 39.6 cents per litre, an increase of 4.8 percent from April 1983 to April 1984. The high price of 46.7 cents was recorded for Labrador while the Humber District had the low of 39.0 cents per litre.

NEWFOUNDLAND

COMPOSITION OF SELECTED REFINED PETROLEUM PRODUCT PRICES (ST. JOHN'S) JUNE 1984

FIGURE 14

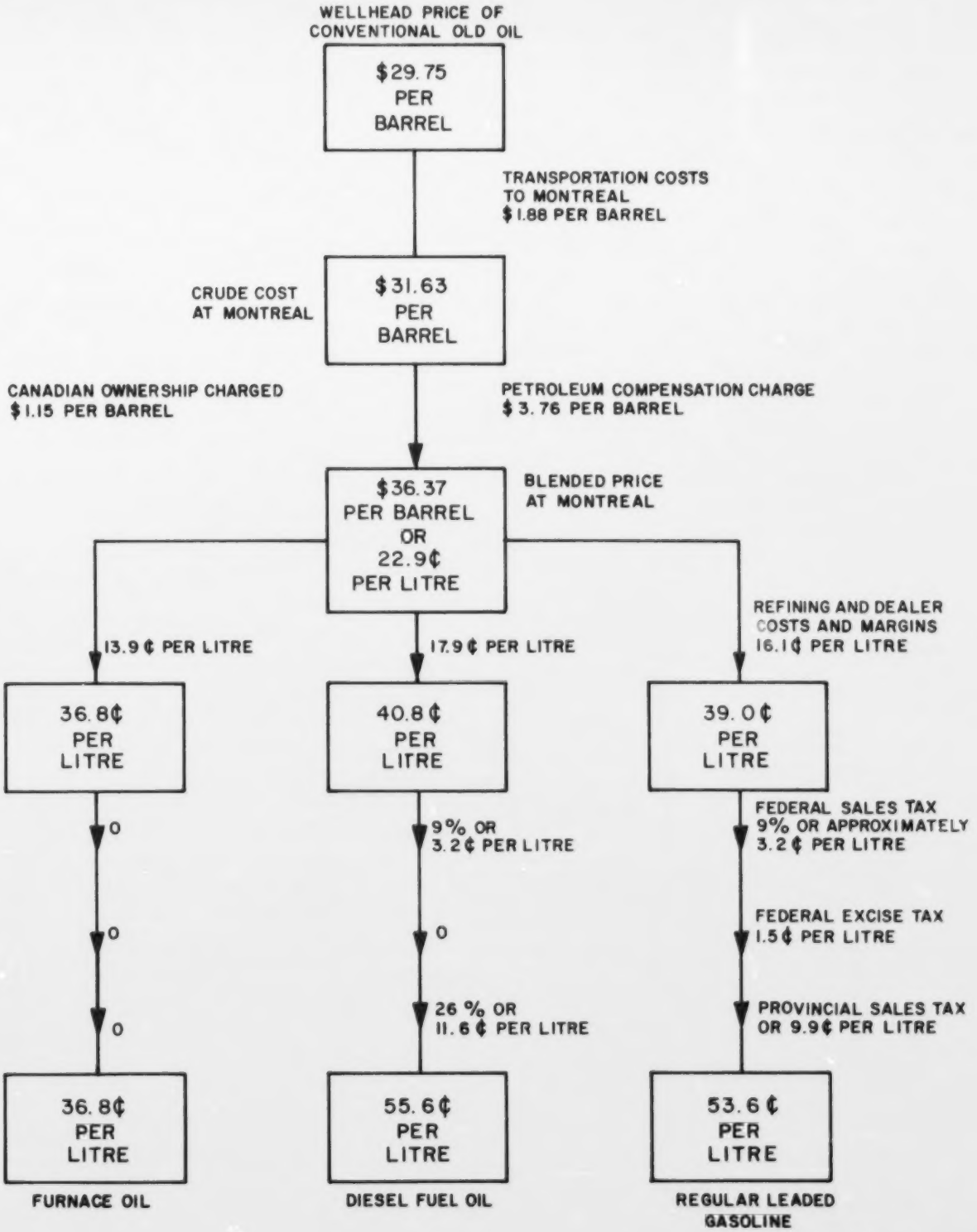

WELLHEAD PRICE OF CONVENTIONAL OLD OIL
$29.75 PER BARREL
TRANSPORTATION COSTS TO MONTREAL $1.88 PER BARREL
CRUDE COST AT MONTREAL
$31.63 PER BARREL
CANADIAN OWNERSHIP CHARGED $1.15 PER BARREL
PETROLEUM COMPENSATION CHARGE $3.76 PER BARREL
$36.37 PER BARREL OR 22.9¢ PER LITRE
BLENDED PRICE AT MONTREAL
13.9¢ PER LITRE
17.9¢ PER LITRE
REFINING AND DEALER COSTS AND MARGINS 16.1¢ PER LITRE
36.8¢ PER LITRE
40.8¢ PER LITRE
39.0¢ PER LITRE
0
0
0
9% OR 3.2¢ PER LITRE
0
26% OR 11.6¢ PER LITRE
FEDERAL SALES TAX 9% OR APPROXIMATELY 3.2¢ PER LITRE
FEDERAL EXCISE TAX 1.5¢ PER LITRE
PROVINCIAL SALES TAX OR 9.9¢ PER LITRE
36.8¢ PER LITRE
55.6¢ PER LITRE
53.6¢ PER LITRE
FURNACE OIL
DIESEL FUEL OIL
REGULAR LEADED GASOLINE

Table 22
Weighted Average Prices
of Petroleum Products
By Census Division
April 1983
(cents/litre)

Census Divisions	Furance Oil	Stove Oil	Regular Gasoline	Unleaded Gasoline	Diesel
Avalon Peninsula	35.7	37.3	54.0	56.1	53.0
Burin Peninsula	36.2	37.6	55.0	56.3	55.6
South Coast	37.4	38.9	55.7	57.2	55.6
St. Georges	35.7	37.3	53.5	55.2	53.0
Humber District	35.7	37.5	54.4	56.2	54.8
Central Newfoundland	36.1	37.8	53.5	55.5	54.5
Bonavista/Trinity	36.1	37.8	54.7	56.4	57.0
Notre Dame Bay	36.6	38.4	55.1	57.1	54.4
Northern Peninsula	37.1	39.0	57.0	58.8	57.2
Labrador	35.1	40.6	55.3	55.7	N/A
Island Average	36.0	37.7	54.4	56.3	54.2
Provincial Average	36.0	37.8	54.5	56.3	N/A

Source: Annual Cost of Fuel and Utilities, Newfoundland and Labrador, 1983

Table 23
Weighted Average Prices of
Petroleum Products by Census Division
April 1984
(cents/litre)

Census Divisions	Furnace Oil	Stove Oil	Regular Gasoline	Unleaded Gasoline	Diesel Fuel Oil
Avalon Peninsula	36.9	39.1	55.8	57.4	55.2
Burin Peninsula	37.3	39.1	55.9	57.7	58.1
South Coast	38.3	40.2	57.1	59.0	58.5
St. Georges	36.8	39.1	55.3	56.9	57.5
Humber District	36.9	39.0	55.4	57.2	56.5
Central Newfoundland	37.2	39.2	55.1	56.7	56.7
Bonavista/Trinity	37.3	39.2	56.1	58.9	58.6
Notre Dame Bay	38.5	40.5	57.4	59.6	57.0
Northern Peninsula	38.9	41.3	57.3	59.6	58.2
Labrador	38.4	46.7	59.1	58.5	N/A
Island Average	37.3	39.4	56.0	57.8	56.4
Provincial Average	37.4	39.6	56.2	57.9	N/A

Source: Annual Cost of Fuel and Utilities, Newfoundland and Labrador, 1984

Table 24
Percentage Change in Petroleum Product Prices
By Census Divisions
April 1983 — April 1984

Census Division	Furnace Oil	Stove Oil	Regular Gasoline	Unleaded Gasoline	Diesel Fuel Oil
Avalon Peninsula	3.4	4.8	3.3	2.3	4.2
Burin Peninsula	3.0	4.0	1.6	2.5	4.5
South Coast	2.4	3.3	2.5	3.1	5.2
St. Georges	3.1	4.8	3.4	3.1	8.5
Humber District	3.4	4.0	1.8	1.8	3.1
Central Newfoundland	3.0	3.7	3.0	2.2	4.0
Bonavista/Trinity	3.3	3.7	2.6	4.4	2.8
Notre Dame Bay	5.2	5.5	4.2	4.4	4.8
Northern Peninsula	4.9	5.9	1.4	1.4	1.7
Labrador	9.4	15.0	6.9	5.0	N/A
Island Average	3.6	4.5	2.9	2.7	4.1
Provincial Average	3.9	4.8	3.1	2.8	N/A

Regular gasoline prices increased an average of 3.1 percent over the period going from 54.5 cents per litre to 56.2 cents per litre. Labrador experienced the highest price at 59.1 cents per litre while Central Newfoundland had the low of 55.1 cents per litre.

The provincial average price of unleaded gasoline increased by 2.8 percent moving from 56.3 cents per litre in April 1983 to 57.9 cents per litre in April 1984. Once again Central Newfoundland recorded the low price of 56.7 cents per litre while the Northern Peninsula and Notre Dame Bay had the high price of 59.6 cents per litre.

Diesel fuel prices increased by 4.1 percent for the Island (Labrador prices not available) going from 54.2 cents per litre to 56.4 cents per litre. Residents of the Avalon Peninsula paid the lowest price of 55.2 cents per litre while Bonavista/Trinity residents paid the high of 57.2 cents per litre.

4.1.3 Petroleum Product Prices — Major Centres Canada

To show how petroleum product prices in Newfoundland compare with those in other provinces, Tables 25 to 27 have been included giving average prices for furnace oil, regular gasoline and unleaded gasoline for the major centres in Canada (prices for stove oil and diesel were not available).

Table 25
Comparative Cost of Furnace Oil
Major Centres Canada

City	April 1983 cents/litre	April 1984 cents/litre	Percentage Change
St. John's	35.4	36.8	4.0
Charlottetown	34.0	35.4	4.1
Halifax	33.9	34.8	2.7
Saint John	33.9	35.5	4.7
Montreal	33.9	35.4	4.4
Ottawa	33.7	35.1	4.2
Toronto	33.2	34.5	3.9
Winnipeg	33.5	35.0	4.5
Regina	32.8	34.2	4.3
Vancouver	33.3	34.4	3.3
Victoria	33.5	34.8	3.9

Source: Statistics Canada

Table 26
Comparative Cost of Regular Gasoline
Regular Filling Stations
Major Centres Canada

City	April 1983 cents/litre	April 1984 cents/litre	Percentage Change
St. John's	53.3	54.9	3.0
Charlottetown	52.8	54.6	3.4
Halifax	49.5	51.4	3.8
Saint John	47.5	49.8	4.8
Montreal	52.1	54.1	3.8
Ottawa	41.5	48.4	16.6
Toronto	37.7	45.1	19.6
Winnipeg	47.7	46.9	(1.7)
Regina	39.3	41.4	5.3
Edmonton	39.6	40.8	3.0
Vancouver	47.8	49.3	3.1
Victoria	47.6	50.2	5.5

Note: Brackets denote decline
Source: Statistics Canada

Table 27
Comparative Cost of Unleaded Gasoline
Regular Filling Stations
Major Centres Canada

City	April 1983 cents/litre	April 1984 cents/litre	Percentage Change
St. John's	55.3	57.5	4.0
Charlottetown	54.9	56.5	2.9
Halifax	51.3	53.2	3.7
Saint John	49.8	52.2	4.8
Montreal	55.2	57.1	3.4
Ottawa	43.9	50.8	15.7
Toronto	40.3	47.4	17.6
Winnipeg	49.5	48.7	(1.6)
Regina	40.6	43.2	6.4
Edmonton	41.3	42.6	3.1
Vancouver	49.9	51.3	2.8
Victoria	49.6	52.0	4.8

Note: Brackets denote decline
Source: Statistics Canada

The tables show that St. John's had the highest prices for all petroleum products. The price of furnace fuel ranged from a low of 34.2 cents per litre in Regina to a high of 36.8 cents per litre in St. John's. Prices for regular gasoline ranged from 40.8 cents per litre in Edmonton to 54.9 cents per litre in St. John's. Edmonton recorded the lowest price for unleaded gasoline at 42.6 cents per litre and St. John's the highest at 57.5 cents per litre.

4.2 Electricity Prices

4.2.1 Electricity Prices in Newfoundland

During 1983 electricity consumers on the Island (those connected to the grid), experienced an increase in price in January of that year and again in August of 1983. Before this the previous rate change occurred in December 1981.

Rate class 3.1, Electric Heat General Service, experienced the highest increase of 33.1 percent over this **period while Street and Area Lighting had the lowest at 7.2 percent.** Domestic customers paid an average of 13.5 percent more for electricity in 1983 then they did in 1982. Customers included in rate class 2.1, General Service 0-10 kw, saw prices increase by 12.6 percent while those in rate class 2.2, General Service 10-100 kw, and 2.3, General Service over 100 kw experienced increases of 9.1 percent and 8.6 percent respectively.

For domestic customers on the Island and in Labrador serviced by diesel generation electricity rates increased 15.4 percent while rates for rate class 2.5, General Service increased by 12.3 percent.

For those interconnected customers in the Happy Valley (Goose Bay and North West River) rates did not increase over the period.

Table 28
Newfoundland Light & Power Co. Ltd.
and Power Distribution District Percentage Increases
in Electricity Rates By Rate Class
1983

Rate Class	Percentage Increase
1.1 Domestic	13.5
2.1 General Service 0-10 KW	12.6
2.2 General Service 10-100 KW	9.1
2.3 General Service Over 100 KW	8.6
3.1 Electric Heat General Service	33.1
3.2 All Electric General Service 0-100 KVA	16.7
3.3 All Electric General Service Over 100 KVA	11.2
Street and Area Lighting	7.2

Note: Excludes Fuel Adjustment Charge which will continue as a separate charge where applicable.
Source: Newfoundland Light & Power Co. Ltd. and Power Distribution District

4.2.2 Electricity Prices — Major Centres Canada

Table 29 gives countrywide comparisons of electricity prices for small service commercial/industrial accounts. Over the one year period Toronto consumers experienced the highest increase of 9.7 percent in electricity rates, the highest in the country, while Charlottetown consumers experienced a decrease of 9.1 percent.

Table 29
Comparison of Electricity Unit Costs
For Commercial/Industrial Accounts Small Service
Major Centres — Canada
December 1983 and December 1984

	Unit Cost Dec. 1983 ($/gigajoule)	Unit Cost Dec. 1984 ($/gigajoule)	Percentage Change
St. John's	16.47	17.64	7.1
Charlottetown	32.74	29.76	(9.1)
Halifax	22.39	22.39	-
Saint John	17.18	18.19	5.9
Montreal	12.97	13.73	5.9
Toronto	14.67	16.09	9.7
Winnipeg	8.83	9.54	8.0
Regina	13.81	15.02	8.8
Edmonton	14.47	15.37	6.2
Vancouver	12.70	13.68	7.7

- All costs are calculated using the rules for Firm Power Published by the Electric Utilities.
- Small Service is calculated on the basis of 100-KW demand, 30,000 KWH/monthly energy consumption (Power Factor: 90%).

Source: Energy Pricing News

In 1984 consumers in Charlottetown paid the highest price of $29.76 per gigajoule while consumers in Winnipeg paid the low of $9.54 per gigajoule. The average price throughout the country equalled $17.14 per gigajoule. Consumers in St. John's paid slightly more than average at $17.64 per gigajoule.

For the larger consumers, as given in Table 30, the picture was much the same. The highest electricity prices were paid in Charlottetown while the lowest were paid in Winnipeg. St. John's consumers again paid slightly above the average.

Table 30
Comparison of Unit Electricity Unit Costs
For Commercial/Industrial Accounts
Medium — Large Service Major Centres — Canada
December 1983 and December 1984

	Unit Cost Dec. 1983 ($/gigajoule)	Unit Cost Dec. 1984 ($/gigajoule)	Percentage Change
St. John's	13.79	14.59	5.8
Charlottetown	31.37	28.04	(10.6)
Halifax	16.20	16.20	-
Saint John	14.17	15.03	6.1
Montreal	10.53	11.08	5.2
Toronto	12.35	13.56	9.8
Winnipeg	7.04	7.60	8.0
Regina	11.71	12.08	3.2
Edmonton	12.11	12.69	4.8
Vancouver	10.25	11.08	8.1

- All costs are calculated using the rules for Firm Power published by the Electric Utilities.
- Medium — Large Service is calculated on the basis of 1,000-KW demand, 400,000-KWH monthly energy consumption (Power Factor: 90%).
- Costs listed here do not provide for discounts offered by some utilities for payment within a specified period.

Source: Energy Pricing News

Conversion Factors

Kilo = 10^3	1 megalitre = $10^3 m^3$ (or 1000 cubic metres)
Mega = 10^6	1 B.t.u. = 1.054615 x 10^3 Joules
Giga = 10^9	1 Barrel = .158908 cubic metres
Tera = 10^{12}	1 Cubic foot = .02832784 cubic metres
Peta = 10^{15}	1 Ton = .9071847 metric tonnes = 1 short ton

Refined Petroleum Products

1 Barrel Liquified Petroleum Gases	= 4.3186 GJ
1 Barrel Aviation Gasoline	= 5.3263 GJ
1 Barrel Motor Gasoline	= 5.5071 GJ
1 Barrel Aviation Turbo Fuel	= 5.7102 GJ
1 Barrel Kerosene	= 5.9870 GJ
1 Barrel Light Fuel Oil	= 6.1458 GJ
1 Barrel Diesel Fuel Oil	= 6.1458 GJ
1 Barrel Heavy Fuel Oil	= 6.6308 GJ

Electricity

1 Gigawatt Hour	= 3600 GJ

Coal

1 Tonne Anthracite	= 29.527 GJ
1 Tonne Canadian Bituminous	= 29.295 GJ
1 Tonne Sub Bituminous	= 19.763 GJ
1 Tonne Lignite	= 15.345 GJ

Non-Energy Products

1 Gigalitre Asphalt	= 44.464 GJ
1 Gigalitre Lubricating Oils and Greases	= 39.155 GJ
1 Gigalitre Naptha Specialties	= 35.173 GJ
1 Tonne Coke	= 28.830 GJ